LURAGROUP

AN ISSUE PAPER PERTAINING TO THE REVIEW OF ALTERNATIVES TO RESOLVE AIR TRAFFIC CONGESTION IN THE TORONTO AREA

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PREFACE

In preparation for the Environmental Assessment and Review Process (EARP) review of proposals to resolve the problem of air traffic congestion in the Toronto area, the Federal Environmental Assessment Review Office (FEARO) retained the services of LURA Group to prepare an issue paper on this important matter.

The issue paper will be widely distributed prior to the Environmental Assessment Panel's scoping meetings on proposed measures to deal with air traffic congestion in the Toronto area. The purpose of the issue paper is to both encourage and focus discussion on various alternative solutions to congestion and their potential economic, social and environmental effects.

The paper does not probe in depth the issues normally dealt with by experts and key actors. Its usefulness lies in highlighting issues and the interrelationship between issues. The paper is specifically designed to be readable and understandable by the general public and should be useful reading for technical experts, managers and policy and decision makers.

The LURA Group has made every effort to describe the various issues in a concise, factual and well-focused fashion. Because FEARO wanted the report to be neutral and not draw any conclusions, the major issues are raised in the form of open-ended questions integrated into and highlighted within the text.

The terms of reference for the Environmental Assessment Panel define the range of contents of this issue paper. The Panel, according to the terms of reference, has been directed to undertake a public review of the economic, social and environmental effects of Transport Canada's proposed medium- and long-term measures to address the problem of increasing air traffic at the Lester B. Pearson International Airport (LBPIA). The medium-term measures include the expansion of runway capacity at the airport to resolve the present aviation congestion and to ensure the efficiency of airport use until the end of this century. The long-term measures involve determining the ultimate capacity of the

airport and identifying the role that other airports in southern Ontario could play in accommodating the aviation needs of the Toronto area. The alternatives and issues related to these proposed measures are covered in this paper in a generic sense.

As Transport Canada's transportation regulatory policies are outside the mandate of the Environmental Assessment Panel, issues relating to these policies -- including private ownership of airports -- are not addressed in this issue paper.

In order to identify issues relating to Transport Canada's proposals, an extensive literature review was undertaken. Especially useful was newspaper coverage of the proposed initiatives in local newspapers -- such as the Mississauga News, Etobicoke Guardian, and Brampton Times -- following the Minister of Transport's announcement in August, 1989. These newspapers provided indepth reports on a variety of issues and viewpoints with respect to air transportation in the Toronto area.

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CHAPTER ONE

AIR TRANSPORTATION IN THE TORONTO AREA: YESTERDAY AND TODAY

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1.0 INTRODUCTION

The importance of air transportation in contemporary society has grown considerably over the last twenty years. On a worldwide basis, increasing numbers of people are choosing air travel for business, recreational and other purposes each year. The world aviation market is forecast to continue growing at a rate of more than seven percent annually during the next decade.

One result of this growing demand for air services has been a substantial increase in the volume of air traffic at airports throughout the world. This has led to congestion and overcrowding at many airports as well as general concern about the overall environmental impacts -- including air pollution and contribution to the "Greenhouse Effect" -- associated with the aviation industry.

Lester B. Pearson International Airport (LBPIA) has the highest volume of air traffic of any airport in Canada, and it is anticipated that this traffic will continue to increase. The growth in air traffic at this airport has been stimulated by the strength of the economy in southern Ontario, as well as the impact of economic regulatory reform on the domestic air carrier industry. This growth has resulted in severe congestion at the airport, especially on the runways and in the air terminal buildings.

To resolve the problem of increasing air traffic congestion in the Toronto area, Transport Canada has proposed a series of medium- and long-term measures. The medium-term measures include the expansion of runway capacity at LBPIA to address the present aviation congestion and to ensure the efficiency of airport use until the end of the century. The long-term measures involve determining the ultimate capacity of LBPIA and identifying the role that other airports in southern Ontario could play in accommodating the aviation needs of the Toronto area. Because these measures carry with them certain economic, social and environmental impacts, Transport Canada has referred its proposals to the federal Minister of the Environment for public review under the Environmental Assessment and Review Process (EARP).

In preparation for this review, the Federal Environmental Assessment Review Office (FEARO) retained the services of the LURA Group to prepare "An Issue Paper Pertaining to the Review of Alternatives to Resolve Air Traffic Congestion in the Toronto Area". The intended purpose of this issue paper is to encourage public interest, understanding and discussion of the issues that may be raised during the EARP review. The paper provides a basic background to the review: what it will cover, why it is being held, and what major issues may be discussed. It will be distributed widely in order to catalyse and stimulate public discussion on the relevant issues in preparation for scoping workshops which will be held as part of the EARP process.

This document is divided into three chapters. Chapter 1 provides a historical overview of air transportation in the Toronto area and outlines the current status of aviation in the region. Also included in this chapter is a description of the Environmental Assessment and Review Process which will review proposed solutions to increasing air traffic congestion in the Toronto area.

Chapter 2 examines a range of possible approaches to dealing with the problem of aviation congestion in the Toronto area.

Chapter 3 then considers the impacts -- economic, social and environmental -- which may result from the implementation of measures or solutions to mitigate aviation congestion.

Finally, a list of additional suggested readings is included for those seeking more detailed information on the issues.

1.1 AIR TRANSPORTATION IN THE TORONTO AREA

During the past fifty years, a network of international and regional airports has emerged to serve the needs of air travellers in the Toronto area. The cornerstone of this network is Lester B. Pearson International Airport which has become Canada's busiest airport, and one of the twenty busiest airports in the world. This airport accommodates jet traffic from all parts of the globe and serves as a transportation hub for sixty-five international and domestic airlines. In 1988, more than twenty million passengers passed through its gates[1].

Three other airports in the Toronto area -- Toronto Island, Hamilton and Buttonville -- cater mainly to commuter, charter and private flights, and are limited in their capacity to handle large aircraft and volumes of passengers. A number of smaller local airports located in various centres in southern Ontario provide takeoff and landing facilities for short-haul flights by small aircraft. The Federal National Defence Department also operates a military air base at Downsview, but the airport is used only for military purposes.

Figure 1 illustrates the location of existing airports in the Toronto area and also indicates a former proposed location for a second international airport northeast of Toronto near the Town of Pickering.[2]

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[1] Transport Canada statistics.

[2] As will be discussed in Section 1.1.6, this 1972 proposal was shelved in 1975.

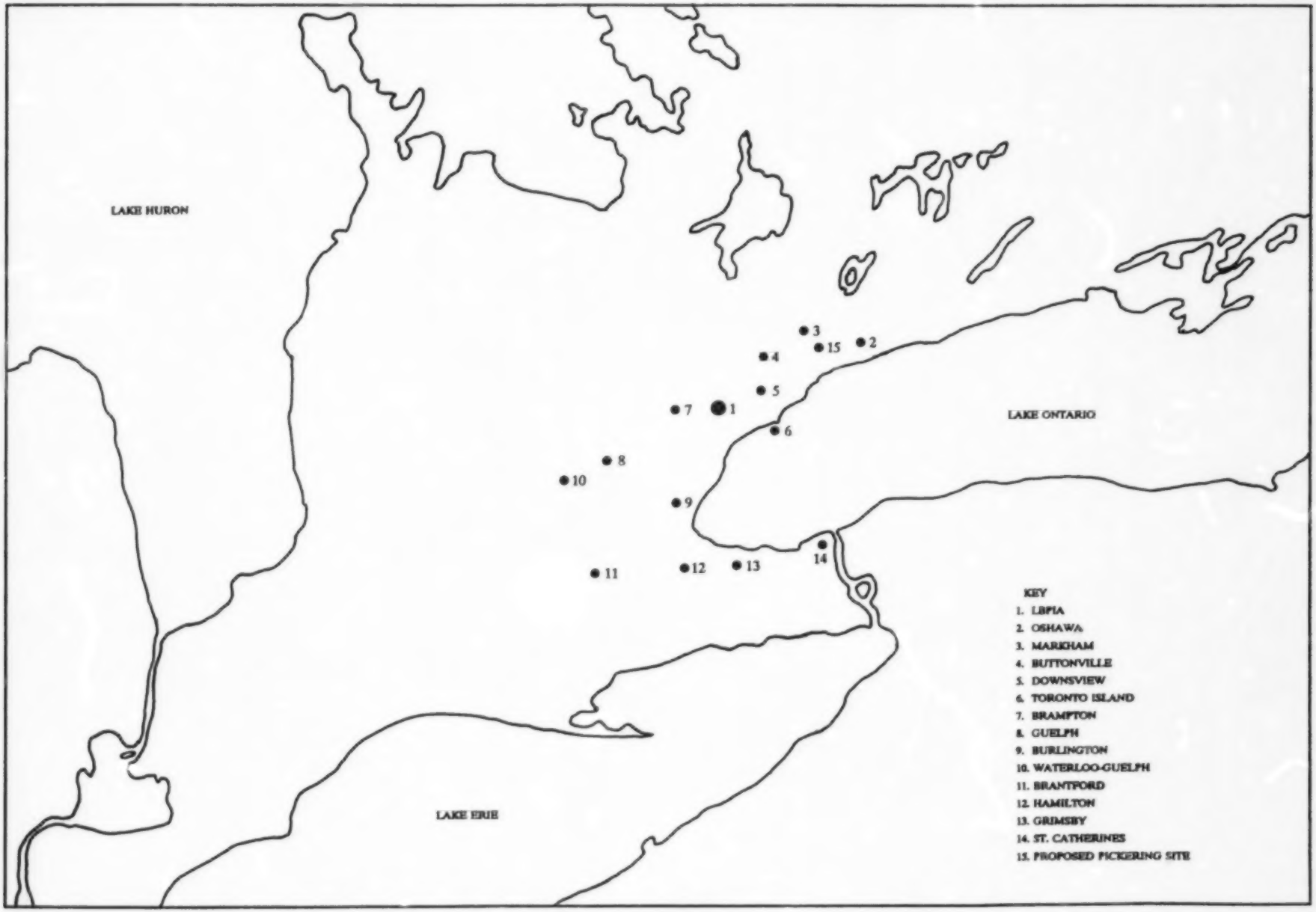

FIGURE 1: Airports in the Toronto area. Source: Ontario Ministry of Transport.

1.1.1 Lester B. Pearson International Airport

The site of what is now known as Lester B. Pearson International Airport was selected by the City of Toronto in 1937. The airport, originally called Malton Airport, was located twenty-seven kilometres northwest of downtown Toronto and consisted of two hard-surface runways, a grass landing strip, and a terminal building which was formerly a farmhouse.

The first official landing at the airport was by an American Airlines DC-3 carrying airline officials to the Canadian National Exhibition in August, 1938. Two days later, the first landing by a Canadian carrier took place when a Trans Canada (now Air Canada) Lockheed Electra touched down at the airport.

In 1939, a larger terminal building was erected to replace the original terminal and the construction of hangars for aircraft was started. In the same year, the declaration of war resulted in the rapid development of aviation-related industries and training schools in the vicinity of the airport.

In January 1940, the airport was leased by the federal government from the City of Toronto. By the late 1940s, major additions had been made, including the expansion of the original two runways and the addition of a third runway. A new terminal building and a second building to provide customs and postal services were constructed in 1949. By the end of the decade, almost 500,000 passengers were using the airport annually[3].

By 1956, the airport was the busiest in Canada, prompting plans for further expansion of the existing terminal building. The planned introduction of jet-powered passenger aircraft such as the B-707 and DC-8, made it necessary to increase the length of at least one of the three runways and in 1957, the first "long" runway was completed. Also in April of that year, the Federal Department of Transport assumed control and ownership of the airport

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[3] Statistics used in Section 1.1.1 are taken from "Fifty Years at Lester B. Pearson International Airport" by Peter R. Tidd, 1989.

when Toronto Council handed over responsibility to the federal authority. In 1958, a comprehensive long-range plan for the airport was developed and called for the construction of four circular terminals to be built progressively as air traffic and passenger volumes increased. In 1959, airport officials granted landing rights to the first trans-oceanic carrier, British Overseas Airways Corporation, and the airline introduced regular international service the following year.

By 1960, the airport was handling 2.25 million passengers annually, as well as increasing numbers of regularly scheduled carrier flights, cargo flights and private flights. Due to the fact that it was now accommodating trans-oceanic aircraft, the name of the airport was changed to Toronto International Airport in November 1960. To meet increasing demands, a second "long" runway was completed in 1962, providing the airport with two runways capable of handling the growing number of jet aircraft. In 1964, additional land adjacent to airport property was purchased by the federal government, increasing airport property to 4,200 acres, which is the current size of the airport. In the same year, Terminal 1 -- the first of the four circular aeroquays -- was officially opened along with new cargo and maintenance facilities.

The second half of the 1960s was marked by unprecedented growth in air traffic on a worldwide basis and the new facilities were quickly strained to the limits. The advent of new larger aircraft including the wide-bodied Boeing 747, DC10, and L1011 resulted in further escalations in demand for air travel, and the federal government proposed that the airport be expanded to permit the construction of additional runways, terminals and related facilities. However, public opposition to additional runways was very strong and it was decided that limited improvements to the airport's infrastructure would be undertaken within the existing boundaries of the airport. As part of the improvement plan, construction of a second terminal was started near the end of the decade.

The opening of Terminal 2 in 1972 helped to ease somewhat the still growing traffic demand in the early 1970s. Terminal 2 originally handled only charter flights but Air Canada moved its complete operations there in April, 1973. By 1976, the airport was

processing eleven million passengers annually, and questions arose once again about its ability to adequately handle future traffic demand. The following year, a federal government study concluded that additional capacity was urgently required at the airport, but in 1978 the Minister of Transport reconfirmed the government's earlier stance that new runways would not be built and that there would be no expansion beyond the current boundaries.

By 1980, annual passenger volumes had reached 15 million and problems with air traffic congestion and overcrowding in terminal buildings were becoming more apparent. In 1982, an Airport Master Plan was developed which called for the construction of a third terminal and improvements in cargo, maintenance and air traffic control facilities. At the same time, an economic recession occurred, easing demand and passenger volumes dropped for several years.

In 1984, the name of the airport was officially changed to Lester B. Pearson International Airport. Some of the improvements called for in the 1982 Master Plan had been implemented prior to 1984 and allowed the airport to better cope with the rising traffic and passenger volumes in that year. By 1986, passenger volumes reached 17.5 million annually and have continued to rise steadily to this day. A major factor in this growth was the introduction of regulatory reforms by the federal government in 1984 which allowed Canadian airlines to choose their own service patterns and pricing strategies. These reforms resulted in increased competition among domestic airlines as well as LBPIA becoming the competitive hub for the two major carriers and their associated commuter carriers. Subsequently, construction of Terminal 3 was commenced and the terminal is scheduled to open in 1990.

1.1.2 Toronto Island Airport

Toronto's first airport was not LBPIA but Toronto Island Airport, located at the western end of Toronto Island 120 metres from the City's mainland. Construction of the 494 hectare airport began in 1937 and was completed prior to World War II. During the war,

the airport was used as a training base for Norwegian pilots. After the war ended, it became very popular with private flyers and developed into an important air ambulance and seaplane base.

Toronto Island Airport has three short runways which are ideal for propeller-driven Dash 7 and Dash 8 aircraft. Recently, these STOL (Short Takeoff and Landing) commuter aircraft have become very popular for short-haul flights to Ottawa and Montreal and have rejuvenated commercial aviation at the airport, which handled over 400,000 passengers in 1988[4].

In November 1989, the Toronto Harbour Commission, which runs the airport, approved a proposal to expand airport operations to accommodate four additional carriers. It is expected that the plan will result in an increase in the number of commercial flights at the airport from the current level of 42 per day to over 100. The proposal also calls for the construction of a new terminal building and a fee for passengers using the airport.

However, there are limits to the airport's ability to undergo significant expansion beyond its current dimensions. Although it is conveniently located near the city centre, there is no "fixed link" between the mainland and the airport and a 1983 agreement between the Harbour Commission, the City of Toronto and Transport Canada banned the construction of a tunnel or bridge[5]. As such, passengers must board a ferry to reach the airport. Furthermore, jets are not permitted to use the airport, effectively excluding its use by many corporate, commuter and courier aircraft.

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[4] Allaby, Ian, "Airport Woes", in Canadian Geographic, Aug/Sept, 1989.

[5] A recent report by the Crombie Commission (Crombie, David, Royal Commission on the Future of the Toronto Waterfront, Interim Report, August, 1989) called for this ban to be maintained.

1.1.3 Hamilton Airport

Hamilton Airport, located eighty kilometres west of Toronto, has historically catered to private aircraft. However, in the last two years, it has become a base for commercial flights to Ottawa, Montreal and Pittsburgh. In 1988, 50,000 passengers used the airport[6].

With its current facilities, Hamilton Airport can accommodate some types of jet aircraft, including B737-200 type airplanes. Larger aircraft cannot use the airport due to a lack of adequate taxiways and terminal facilities. The airport's infrastructure, including support roads and parking lots, also limits its ability to handle larger aircraft and additional passenger traffic.

1.1.4 Buttonville Airport

Buttonville Airport is located twenty kilometres north of downtown Toronto and is used primarily by private and business fliers. The airport handles approximately 160,000 private and corporate flights annually[7] and is widely favoured by the business community because of its close proximity to the business core of Toronto. Recently, the airport has introduced some limited commercial service.

The long-term future of Buttonville Airport is unclear as it is privately owned and operated. Thus, there is some question as to whether its owner will continue to use airport property for this function.

1.1.5 Other Regional Airports

To the west, north and east of Lester B. Pearson International Airport, there are over fifty small local airports in operation, serving such communities as Brantford, Guelph, Brampton

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[6] Allaby, ibid.

[7] Allaby, ibid.

and Oshawa. Currently, these airports accommodate mainly private aircraft and are only of local significance.

1.1.6 Pickering Airport Proposal

In 1972, the governments of Canada and Ontario issued a joint announcement that they intended to build a second international airport near the Town of Pickering. This announcement was in response to growing air traffic and passenger volumes at LBPIA. Earlier proposals to expand runway capacity at LBPIA had been rejected due to public opposition and it was deemed necessary to construct a second airport to meet future demand in the Toronto area. In support of this proposal, the federal government purchased 18,000 acres of land in 1972, forty kilometres northeast of downtown Toronto.

However, strong local opposition to the proposed airport, headed by a group called "People or Planes", and overall public uncertainty about the need for a second international airport caused the proposal to be shelved in 1975. The project was abandoned when the provincial government declared that it would not provide the required roads and services for the airport. The federal government has retained ownership of the land near Pickering and has not yet decided what to do with it.

1.2 THE CURRENT SITUATION

As is evident in the preceding discussion, there has been considerable growth in both air traffic and passenger volumes in the Toronto area in the last twenty years. This is particularly true at LBPIA, where growth in air traffic has averaged 2.8% since 1968 and passenger growth has averaged 7.4% for that same period[8]. Figure 2 illustrates that the number of aircraft movements at the airport has increased substantially (35.4%) during the last five years and Figure 3 shows a similarly dramatic increase in the volume of passengers

[8] Tidd, Peter, 1989.

(38.7%) since 1984. This growth has led to the following effects:

* overcrowding and congestion in the terminal buildings at LBPIA;

* delays for passengers taking off from LBPIA;

* delays for passengers en route to LBPIA from other airports -- such as those at Ottawa and Montreal (this situation is now referred to as "gridlock", where planes cannot take off from other airports until clearance is received from LBPIA); and

* an increase in the amount of noise experienced by residents in the vicinity of LBPIA.

Increased air traffic has also given rise to issues relating to safety. For example, concern has been expressed about the rising number of "loss of separation" incidents (where aircraft come dangerously close to one another) at LBPIA.

The substantial growth in air traffic at LBPIA has brought into question the ability of existing facilities at the airport and other airports in the Toronto area to meet rapidly increasing demand in the future. Passenger volumes are forecast to rise to 30 million in the year 2001. For the same year, aircraft activity is expected to reach 450 thousand movements. Clearly, the aviation system in the Toronto area must adapt to meet this future demand.

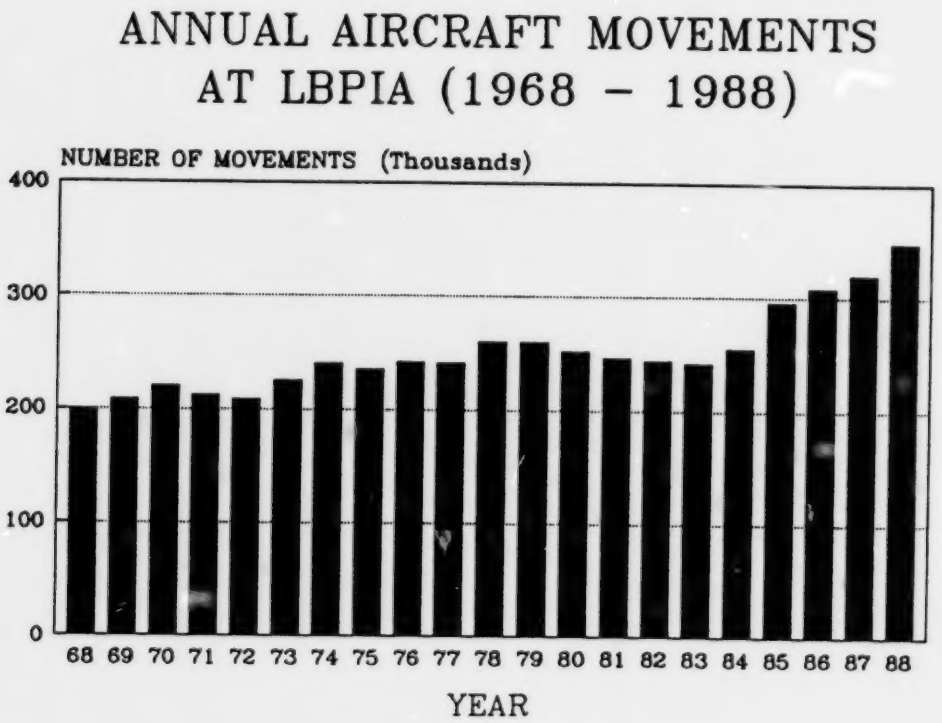

FIGURE 2: Annual aircraft movements at LBPIA (1968 - 1988). Source: Tidd, 1989.

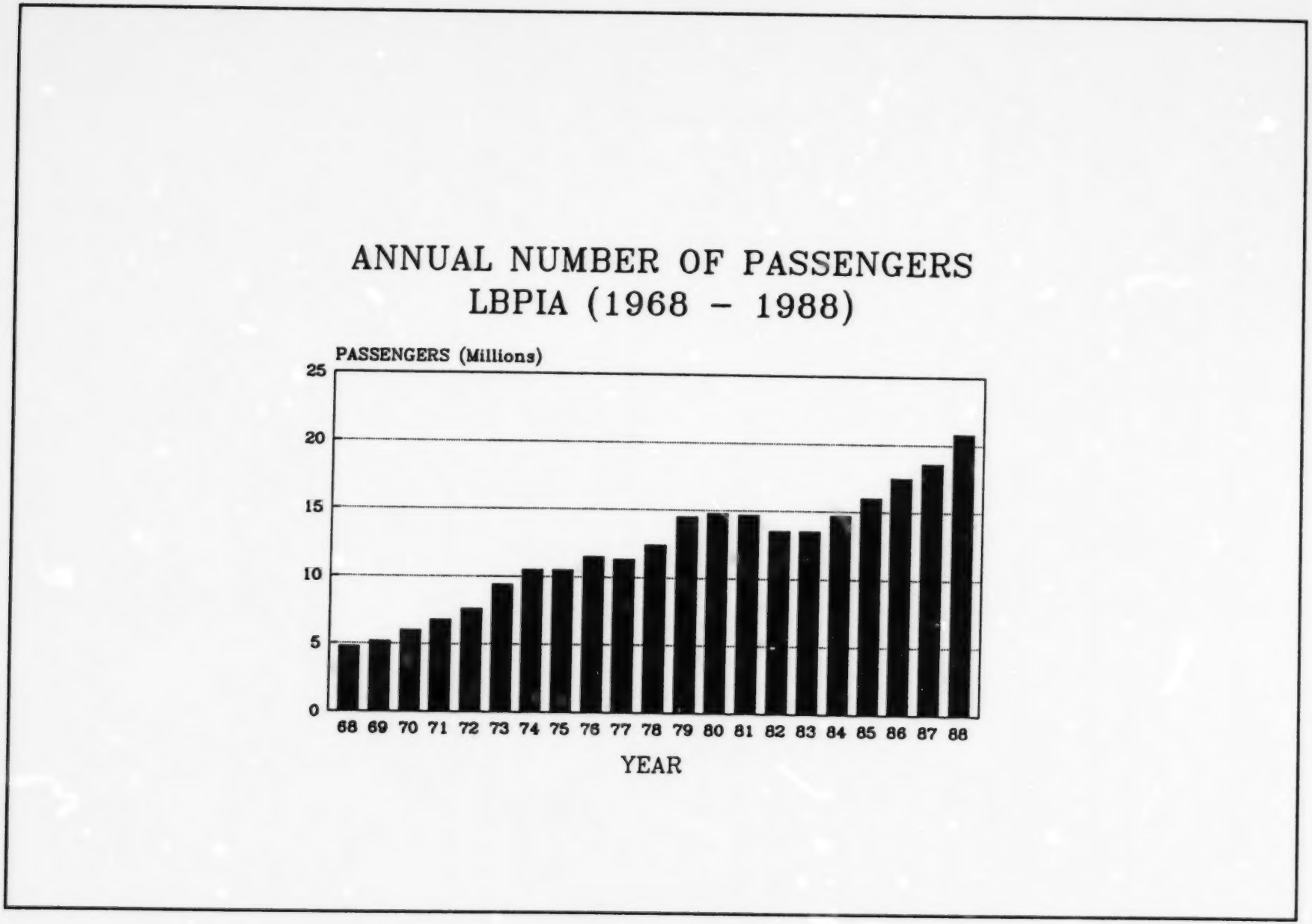

FIGURE 3: Annual number of passengers at LBPIA (1968 -1988). Source: Tidd, 1989.

1.3 THE ENVIRONMENTAL ASSESSMENT AND REVIEW PROCESS

In August 1989, the federal Minister of Transport, the Honourable Benoît Bouchard, announced that Transport Canada had proposed some medium and long-term measures to resolve the problem of air traffic congestion in the Toronto area. As mentioned previously, the medium-term measures include the expansion of runway capacity at LBPIA to address the present aviation congestion and to ensure the efficiency of airport use until the end of the century. The long-term measures involve determining the ultimate capacity of LBPIA and identifying the role that other airports in southern Ontario could play in accommodating the aviation needs of the Toronto area. The Minister also announced that he had requested the Minister of the Environment to initiate the Federal Environmental Assessment and Review Process (EARP) to review the Transport Canada proposals.

As a first step in the EARP process, an Environmental Assessment Panel has been formed. The panel will undertake a public review of the economic, social and environmental effects of the medium- and long-term measures proposed by Transport Canada.

To address the problem of aviation congestion in the medium-term, the Panel will examine issues and impacts associated with proposals for construction of additional runways at LBPIA. Included in this review will be consideration of noise, air and water emissions, other impacts resulting from construction and operation of additional runways and economic benefits and disbenefits. The Panel has been instructed to report on its findings relating to medium-term measures approximately one year from its formation.

With regard to long-term measures, the Panel will examine:

- the economic, social and environmental implications of Transport Canada's announced proposals to accommodate the increased demand for air services in southern Ontario;

* the roles that LBPIA and other airports in the Toronto area may be able to play in accommodating future demands for aviation services; and

* Transport Canada's master plan for LBPIA and aviation plans for southern Ontario and the economic, social and environmental implications of these plans for land and air traffic in the Toronto area.

In addition, the Panel will consider mitigating actions which may be taken to reduce any negative economic, social or environmental effects which may result from the medium- or long-term proposals.

Transport Canada's transportation regulatory policies are outside the Panel's mandate and will not be addressed during the EARP review.

CHAPTER TWO

THE RANGE OF ALTERNATIVES

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2.0 INTRODUCTION

The preceding discussion of the history and current status of air transportation in the Toronto area raises two interrelated questions:

"What can be done to alleviate current problems?"

"What can be done to ensure that current problems do not reoccur in the future?"

The first question relates to the steps or measures that can be taken today to alleviate the specific problem of air traffic congestion. The second question relates to the overall approach or strategy which should be developed and implemented to sustain an efficient air transportation program in the Toronto area.

The search for acceptable answers to both of these questions is subject to one further

consideration:

> "Should solutions to current problems be considered in isolation or should they be evaluated also in terms of their potential for assisting in long-term solutions?"

In this chapter, we review a range of possible solutions to the problem of increasing air traffic congestion in a very generic way. Judgements on whether or not the solutions presented are medium- or long-term are left to the reader.

2.1 THE "DO-NOTHING" APPROACH

At first glance, the "do-nothing" approach may seem to be contradictory to the process of searching for a solution to the problem of increasing air traffic congestion. However, in any search for solutions, standing back and asking the following question has a number of advantages:

> "What are the consequences of doing nothing?"

Further, considering the "do-nothing" approach allows one to ask:

> "Is there a problem?" and "Who is saying there is a problem?"

This perspective also helps to focus attention on the problem or problems rather than on the solutions. Stated another way, this perspective helps to separate the issue of problems from symptoms of problems. For example:

> "Is air traffic congestion at Lester B. Pearson International Airport a problem or a symptom of the problem?"

Answers to this question and others like it will prove helpful in identifying measures and a subsequent strategy to deal with air traffic today and tomorrow in the Toronto area.

The "do-nothing" approach also focuses attention on what works and what does not work in air traffic management. Given the number of air transportation facilities in the Toronto area and the wide variation in their size, the potential for identifying what works and what does not work probably exists somewhere in the region. For example:

> "What are the positive and negative features of existing air transportation facilities across the region today?"

2.2 IMPROVE EXISTING FACILITIES AT LPBIA

Improving existing facilities offers a number of opportunities for air transportation problem solving. Improvements may be sought to increase either efficiency or capacity. A number of initiatives have already been undertaken by Transport Canada to improve the efficiency and the capacity of LBPIA. These include:

1) installation of new computer tracking equipment for air traffic control as part of the national Radar Modernization Project (RAMP) and the Canadian Automated Air Traffic Services (CAATS) system;

2) an accelerated program to recruit experienced air traffic controllers from other jurisdictions and to train new air traffic controllers;

3) the placement of a cap (or ceiling) of 70 arrivals and departures per hour at the airport to reduce congestion in the air and on runways;

4) shifting cargo and private flights to off-peak hours to reduce delays for commuter and other scheduled flights;

5) discussions with the aviation industry to introduce "peak-period pricing" to encourage aircraft operators to land and take off during off-peak hours;

6) implementation of a new noise-management approach based on noise emission rather than aircraft type, with new monitoring equipment, increased fines for noise violations, and encouragement of the use of quieter "Chapter 3" aircraft; and

7) implementation of plans to renovate Terminals One and Two, and the completion of Terminal 3 by mid-1990.

Further opportunities may exist to either increase efficiency and/or capacity at LBPIA. Associated with these opportunities is the question:

"What would be the impact on efficiency and capacity at the airport of implementing these measures?"

An important consideration for improving the efficiency and capacity of existing air transportation relates to the supporting ground transportation infrastructure:

"How would measures taken to increase capacity and efficiency at LBPIA affect the capability of the existing ground infrastructure to meet the needs of airport users?"

Also to be considered in this category is the type of use of LBPIA by the various airlines. For example:

"What benefits for efficiency and capacity, if any, are to be gained from altering the current practice of feeder airlines funneling travellers from outlying communities to LBPIA to board long-range aircraft?"

2.3 EXPAND EXISTING FACILITIES AT LPBIA

Taking existing air transportation facilities and expanding them can be accomplished in several ways. Non-structural management initiatives may provide a wide range of opportunities. As an example, in terms of combined takeoffs and landings:

> "What would be the effect of relaxing the current 70 flight-an-hour cap at LPBIA?"

> "What would be the effect of increasing the hours of operation of the airport?"

A third terminal building for LBPIA will open in 1990, boosting the airport's capacity to 30,000,000 passengers annually. Additional expansion of ground facilities at LPBIA in order to handle both more aircraft and passengers holds out the potential for alleviating chronic problems on the ground such as passenger congestion in terminals.

> "Is the addition of new terminals at LPBIA significant as a solution to air traffic congestion problems?"

From a structural perspective, additional runways at LBPIA would appear to be one means of increasing capacity. While the expansion benefits provided by additional runways may seem obvious, a number of considerations should be taken into account:

> "Are other changes (physical and/or operational) necessary in order to realize the capacity benefits of additional runways?"

> "What effects do the geographical alignment of runways have on their potential to increase the number of air carriers that can be handled?"

2.4 INTEGRATE EXISTING OR IMPROVED REGIONAL FACILITIES

Considering the existing air transportation facilities as a system rather than separate entities may offer other opportunities for alleviating problems in the Toronto area. Recently, for example, some air carriers have begun to use Hamilton Airport for some types of flights.

"What potential exists for use of the existing regional airports?"

"What opportunities are offered by directing certain types of planes to specific airports?"

"What opportunities are offered by dedicating certain airports to specific passenger types?"

Maximizing the efficient use of regional airports may require upgrading or improvements to those facilities in terms of length of runways, capacity of terminal buildings and other ground support systems.

"What improvements would be necessary to maximize the use of regional airports?"

"What opportunities for increased efficiency is offered by improved ground transportation linkages between existing airports?"

2.5 DEVELOP NEW FACILITIES

Construction of new air transport facilities may offer a range of solutions to current air transportation problems. Two of the more notable proposals in the recent past have included the construction of a new airport in Pickering, and the landfilling of a suitable area of Lake Ontario for construction of a new airport.

"Would a new airport augment or antiquate existing airports?"

"Would a new airport have a positive, negative or neutral effect on the efficiency of air transportation in the Toronto area?"

In addition to merely adding to total capacity that can be handled, an equally important question to be posed is:

"Could a new airport compensate for the deficiencies at existing airports?"

2.6 A COMPREHENSIVE TRANSPORTATION SYSTEM

Clearly, air transportation is not the sole means of moving people and goods. In addition to considering the advantages and disadvantages of opportunities within one mode of transportation, the merits of other forms of transportation to complement air transportation must be considered.

"Is there potential for other forms of transportation, in combination with air transportation, to effectively combine and provide an efficient and safe transportation system?"

Important considerations relate to if and how ground transportation -- rail, road and water -- can complement existing air transportation.

"What opportunities are provided by the existing rail, road and water transport facilities?"

"What improvements can be made to existing rail, road and water transport facilities to complement air transportation?"

2.7 COMBINING SOLUTIONS

The range of solutions discussed here should not be considered solely on their individual merits. Combining solutions may be important for two reasons. On the one hand, it is often not advisable to go with one solution as this tends to restrict building flexibility into a system. This is commonly referred to as not putting "all your eggs in one basket". It may also be that some solutions may be attractive for interim alleviation of air traffic congestion at LBPIA while longer-term solutions are being implemented.

> "Could a combination of two or more of the solutions provide acceptable corrective measures to air traffic problems?"

2.8 PERSPECTIVES ON THE ALTERNATIVES

In addition to the considerations discussed earlier in this chapter, the appropriateness of the solution or solutions selected depends on the overall societal goals for transportation in the Toronto area.

Important considerations here are:

> "Is preference to be given to a particular passenger type, for example, the business passenger?"

> "Is transportation in general and air transportation in particular to be developed from the Toronto area perspective or is it to be developed as a hub in the North American transportation network?"

> "Should consideration be given to placing a ceiling on the expansion of air transportation in the Toronto area?"

CHAPTER THREE

CONSIDERING EFFECTS

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3.0 INTRODUCTION

Any activity leads to effects on humans and the environment. Hence, the existing air transportation system in the Toronto area has had, and currently has, effects on humans and the environment. These effects can be either positive or negative. For discussion purposes, it is often helpful to look at positive and negative effects from economic, social and environmental perspectives. The economic, social and environmental effects of the existing air transportation provide a useful starting point for evaluating effects in the future.

Identifying and implementing medium- and long-term solutions to current problems in the Toronto area involve consideration of both positive and negative effects. In addition to assessing the magnitude of these effects, the distribution of the effects to individuals and communities within the Toronto area is also an important consideration. This chapter, then, deals with effects -- both magnitude and distribution -- from economic, social and environmental perspectives.

3.1 ECONOMIC EFFECTS

Historically, the effects of air transportation on urban and regional economies have been far-reaching. At a localized level, for example, airports create jobs and significantly enhance the non-residential tax base for host communities. On a broader geographic basis, air transportation is instrumental in tying urban and regional economies into the broader national and international communities. In both contexts, LBPIA has had significant economic effects on both the urban and regional economies.

Current problems with congestion at LBPIA raise a number of questions relating to economic effects of the existing air transportation infrastructure:

> "What are the economic benefits and the economic costs of the existing air transportation network?"
>
> "On the basis of the existing infrastructure, have the economic benefits reached a threshold?"
>
> "What are the relative economic effects of introducing (or of not introducing) new measures to alleviate current problems of air traffic congestion?"

Answers to questions such as these are geared toward "the greatest good for the greatest number". However, there are equally valid questions that need to be addressed specific to particular social sectors: business, tourism, and local interests, among others.

> "What are the economic needs of respective social sectors and are these being met within the existing air transportation network?"
>
> "On the basis of the existing infrastructure, what if anything, can be done to meet respective social sector requirements?"

"What are the relative economic advantages and disadvantages to respective social sectors of introducing new measures and/or strategy(ies) to alleviate current problems?"

One of the underlying problems related to economic effects is that of accessability. In addition to the two perspectives discussed above, a third perspective seems appropriate:

"What are the economic effects of employing alternative means of transportation -- rail for example -- to enhance accessability and assist in relieving air traffic congestion?"

Finally, in any discussion of economic effects, consideration must be given to overall costs:

"What are the economic costs of the range of solutions to current problems with air transportation in the Toronto area?"

3.2 SOCIAL EFFECTS

Generally speaking, the social effects of an undertaking fall into two categories: those that enhance the quality of life and those that reduce the quality of life. Unlike economic effects, there is great difficulty in quantifying -- attaching a dollar value -- to social effects. In addition, social effects, at least from the individual's point of view, can be very subjective. Despite these difficulties, social effects are important considerations when assessing problems and considering a range of solutions to these problems.

The general social effects related to congestion at LBPIA and with air transportation in general can be addressed from a number of perspectives:

"What are the social effects of the existing air transportation network?"

"What will be the social effects of introducing solutions to alleviate current problems?"

"What will be the social effects of introducing long-term solutions?"

Social effects can be considered from the perspectives of the travelling public as well as the residents of the study area. In general, the travelling public requires convenience and accessability. Residents of a study area are generally concerned with noise, and the health effects arising from noise. Both the travelling public and residents share a concern for air traffic safety.

In addition to these broader questions are the effects to be encountered by the various sectors of society:

"How do the social effects of the existing air transportation network vary from one sector of society to another?"

Important here are issues related to the sharing of positive and negative effects between the business traveller or the vacationer, for example.

"How are the social effects from a particular alternative different from one sector of society to another?"

At issue here would be changes in the positive and negative effects on different social sectors as a result of introducing either medium- or long-term solutions.

Following from the previous question:

"How do we 'weigh' the social effects between sectors of society in order to arrive at the 'best' solutions?"

If the positive and negative effects are currently shared unevenly by different social sectors, then some decision has to be made on the fairness of this sharing before better solutions can be arrived at.

Finally, pertaining to the integration of two or more means of transportation to alleviate problems such as accessibility:

> "Is there, and if so why, a social preference for one mode of transport over another?"

3.3 ENVIRONMENTAL EFFECTS

The environmental effects of any activity are important considerations in making decisions. Environmental effects are not only assessed at a purely local level but from broader regional, and global perspectives.

Issues related to the environmental effects of air transportation in the Toronto area can be approached from a number of directions:

> "What are the environmental effects of the existing air transportation network?"

> "What will be the environmental effects of the range of solutions overviewed in the previous chapter?"

> "What are the important environmental considerations in selecting a preferred solution to existing problems?"

The environmental effects of air transportation and its support facilities on the quality of air, water and land should not be underestimated. For example, the combustion of jet fuel

has certain air quality implications, while de-icing technologies have the potential for impacting the quality of water and the surrounding land. Effects on the natural environment can lead to adverse health effects for people.

Other issues relating to the environmental effects of either introducing medium- or long-term solutions are:

> "Should the environmental effects of a particular measure or strategy be assessed on a local level or should a broader perspective be taken?"

> "Should the environmental effects of an integrated transportation system -- more than one mode of transport -- be an important consideration in the assessment process?"

3.4 DISTRIBUTION OF EFFECTS

Up to this point, attention has focused on the magnitude of effects from economic, social and environmental points of view. Another consideration relates to how the effects -- positive or negative -- are assessed in a distributive sense.

Most obvious, perhaps, of the distributive issues is:

> "How does one 'weigh' the relative importance of economic, social and environmental effects -- both positive and negative -- in selecting a preferred solution?"

Equally important but less obvious are issues related to the geographical distribution of effects. Air transportation has national, regional and local effects on the economy, society and the environment.

"How does one 'weigh' the relative importance of national, regional or local effects -- both positive and negative -- in selecting a preferred solution?"

Many of the effects of air transportation are highly localized. As pointed out earlier, these impacts can be both positive (jobs, for example) and negative (noise or traffic congestion, for example). In terms of the distribution of both the positive and negative effects of air transportation facilities -- whether they be economic, social or environmental -- it can be asked:

"Should the positive effects from air transportation be distributed in the same area as the negative effects?"

"Should solutions to air transportation problems be based on the sharing of negative effects and risks over a broad area, or should they be concentrated?"

"Should solutions to air transportation problems be based on the sharing of positive effects and risks over a broad area, or should they be concentrated?"

Distributive questions such as these at the localized level raise issues related to mitigation and compensation. Consideration of mitigation and compensation requires that the adverse effects of impacts of a project be valued, or brought into the evaluation of solutions:

"How important is mitigation and compensation in the evaluation of solutions to air transportation in the Toronto area?"

From a mitigation perspective, several possibilities exist. For example to curb noise adjacent to airports, turning regulations or take-off and landing restrictions can be introduced. Alterations in the type of aircraft engines and/or fuel may well offer solutions for the environmental impacts of aircraft. Having exhausted the potential mitigation measures to reduce the negative economic, social and environmental effects, there remains the issue of compensation. Issues here not only relate to whether or not compensation

packages should be provided to impacted groups but also as to who should receive compensation and what should be the nature of the compensation packages.

SUGGESTED FURTHER READING

This section provides a list of additional suggested readings on issues related to air traffic congestion in the Toronto area. The readings cited are generally intended for public consumption. The reading materials are accompanied by a brief summary of their content.

Allaby, Ian. "Airport Woes", in Canadian Geographic, Aug/Sept., 1989.

This article provides a good description of problems and issues relating to air traffic congestion at Lester B. Pearson International Airport as well as other airports in the Toronto area. A range of possible solutions to congestion is explored.

Bright, Elsie M. "Secondary Impacts of Airports: An Assessment of Planning Procedures", in Transportation Quarterly, Volume 36, Number 1, January, 1982.

The paper looks at the effectiveness of the airport development process in dealing with secondary impacts. Questions considered include: How is the zone of influence around an airport defined? How are impacts estimated or measured? How should impacts be planned for in the development process.

Crombie, David. Royal Commission on the Future of the Toronto Waterfront, Interim Report. August, 1989.

This report addresses the role of Toronto Island Airport in the future of the Toronto waterfront. See in particular Publication No. 7 of the Royal Commission entitled "The Future of the Toronto Island Airport: The Issues".

Tidd, Peter R. "Fifty Years at Lester B. Pearson International Airport". Unpublished, February, 1989.

The paper provides a detailed history of the development of LBPIA, outlines the current status of the airport, and looks at future requirements.

Transport Canada. Lester B. Pearson International Airport, Master Plan Overview. TP7754.E, July, 1986.

This Transport Canada document includes an overview of the federal agency's Master Plan for LBPIA.

Twidale, Peter. "Please Don't Build Under the Flight Path", in Transpo 84, Volume 7, Number 3, 1984.

The article includes a discussion of land use in the vicinity of airports and considers the impact of aircraft noise on neighbouring communities. Issues relating to airport expansion are also examined.